

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Trent J. Brundage

Art Unit: 2136

Application No.: **09/833,013**

Confirmation No.: 8369

Filed: April 10, 2001

For: DIGITALLY WATERMARKED
MAPS AND SIGNS AND
RELATED NAVIGATIONAL
TOOLS

Via Electronic Filing

Examiner: P. Parthasarathy

Date: April 27, 2006

APPEAL BRIEF

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Sir:

Appellants respectfully request the Board of Patent Appeals and Interferences (hereafter the “Board”) to reverse the outstanding final rejection of the pending claims.

This Appeal Brief is in furtherance of a Notice of Appeal filed February 27, 2006 (postcard stamped March 2, 2006). Please charge the fee required under 37 CFR 1.17(f) or any other fee needed to consider this Appeal Brief to our deposit account 50-1071.

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REAL PARTY IN INTEREST

The real party in interest is Digimarc Corporation, by an assignment from the inventors recorded at Reel 012680, frames 0361-0362, on March 5, 2002.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 7-13, 24, 31 and 32 are pending in the present application.

Claims 7-13 and 24 stand finally rejected. And claims 31 and 32 are allowed. Please see the Office Action Summary in the final Office Action mailed November 25, 2005 – hereafter referred to as “the final Office Action”.

(Claims 1-6 and 30 have been previously canceled. And claims 14-23 and 25-30 are canceled without prejudice in the accompanying Amendment Accompanying Appeal Brief.)

STATUS OF AMENDMENTS

An Amendment Accompanying Appeal Brief is filed concurrently herewith. The claims discussed herein correspond to those remaining after entry of the accompanying amendment.

All other amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates generally to maps and depictions of geographic areas (e.g., satellite imagery). Please see, e.g., the specification, page 1, paragraph [0001]. In some aspects of the invention methods and apparatus are provided to cooperate with such maps and depictions.

Digital watermarking is used to improve these maps, depictions, methods and apparatus. See, e.g., the specification at page 3, paragraphs [0012] and [0013].

Digital watermarking is a form of steganography. Steganography includes the art of encoding physical and electronic objects with plural-bit data. The data is encoded such that it is generally hidden from human perception or is generally imperceptible. Steganographically hidden data is detectable through computer analysis of an encoded object. See, e.g., the specification at paragraph [0013].

One aspect of the invention, as recited in claim 7, is an apparatus (see, e.g., paragraphs [0037] – [0040]) to read digital watermarks embedded within a map (see, e.g., Fig. 1; see also paragraph [0028]). The map is divided into a plurality of areas, with each area including at least one embedded digital watermark including location information for the respective map area (see, e.g., paragraph [0028]; see also Fig. 1, areas A-M, see also paragraphs [0029]-[0035]). The apparatus includes a global positioning system receiver to determine a location of the apparatus (see, e.g., lines 1-2 of paragraph [0042]; see also Fig. 2, reference no. 34); an input device to capture an image of at least a portion of the respective map area (see, e.g. lines 4-7 of paragraph [0041]; see also Fig. 2, reference 28); memory including executable software instructions stored therein, the instructions to extract the location information from the at least one embedded digital watermark from the captured image of at least a portion of the respective map area (see, e.g., lines 7-9 of paragraph [0041]; see Fig. 2, reference no. 24), and to correlate the location of the apparatus with the extracted location information (see, e.g., lines 4-7 of paragraph [0042]); electronic processing circuitry to execute the software instructions (see, e.g., lines 1-3 of paragraph [0038]; see Fig. 2, reference no. 22); and an output device to indicate the correlation of the apparatus location and the captured watermark location information (see, e.g., lines 7-14 of paragraph [0042]; see also paragraphs [0045] – [0046]).

Still another aspect of the invention, according to claim 11, is a method of navigating with a map embedded with digital watermarks. The method includes: machine-reading steganographic indicia from optical scan data representing the map (see, e.g., lines 4-9 of paragraph [0041]), the steganographic indicia including location information which uniquely identifies the map in which the steganographic indicia is embedded in (see, e.g., paragraph [0043]; see also lines 2-3 of paragraph [0042]; see also Fig. 4, S1; see also paragraphs [0029] –

[0032]); comparing the location information to a physical location (see, e.g., lines 4-7 of paragraph [0042]; see also Fig. 4, S2 & S3); and providing feedback to correlate the location information and the physical location (see, e.g., lines 7-14 of paragraph [0042]; see also paragraphs [0045] – [0046]; see also Fig. 4, S4).

Yet another aspect of the invention, as recited in claim 12, is a method of correlating a physical location to a map location. The map is divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective area (see, e.g., paragraph [0028]; see also Fig. 1, areas A-M, see also paragraphs [0029]–[0035]). The method includes: extracting the location information from the watermark at the map location (see, e.g., lines 7-9 of paragraph [0041]; see also lines 2-3 of paragraph [0042]; see also Fig. 4, S1); comparing the extracted location information to global positioning system (GPS) received coordinates of the physical location (see, e.g., lines 4-7 of paragraph [0042]; see also Fig. 4, S3); and providing feedback based on the comparison of the physical location and the map location (see, e.g., lines 7-14 of paragraph [0042]; see also paragraphs [0045] – [0046]; see also Fig. 4, S4).

Still another aspect of the invention, as recited in claim 24, is an apparatus to read digital watermarks embedded within a map (see, e.g., paragraphs [0037] – [0040]). The map is divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective map area (see, e.g., paragraph [0028]; see also Fig. 1, areas A-M, see also paragraphs [0029]–[0035]). The apparatus includes a global positioning system that determines a location of said apparatus (see, e.g., lines 1-2 of paragraph [0042]; see also Fig. 2, reference no. 34); an input to receive optical scan data corresponding to at least a portion of the respective map area (see, e.g. lines 4-7 of paragraph [0041]; see also Fig. 2, reference 28); memory including executable software instructions stored therein, the instructions to extract location information from the optical scan data of at least a portion of the respective map area (see, e.g., lines 7-9 of paragraph [0041]; see Fig. 2, reference no. 24), and to correlate the location of the apparatus with the extracted location information (see, e.g., lines 4-7 of paragraph [0042]); electronic processing circuitry to process the software instructions (see, e.g.,

lines 1-3 of paragraph [0038]; see Fig. 2, reference no. 22); and an output to indicate a correlation of the apparatus location and the watermark location information (see, e.g., lines 7-14 of paragraph [0042]; see also paragraphs [0045] – [0046]; see also Fig. 4, S4).

Another aspect of the invention, according to claim 10, is a method of making a representation of a geographical area. The method includes dividing a representation of a geographical area into a plurality of areas (see, e.g., paragraph [0028]; see also Fig. 1, areas A-M, see also paragraphs [0029]–[0035]); and steganographically encoding plural-bit location data within each of the plurality of areas, wherein the location data is unique per each of the plurality of areas (see, e.g., paragraph [0028]; see also Fig. 1, areas A-M, see also paragraphs [0029]–[0035]).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 7 – 13 and 24 stand finally rejected as being unpatentable over U.S. Patent No. 5,848,373 (hereafter referred to as “the DeLorme patent”) in view of U.S. Patent No. 6,748,362 (hereafter referred to as “the Meyer patent”).

ARGUMENT

Appellants respectfully request that the final rejection of claims 7-13 and 24 be reversed since the applied references fail to teach or suggest all of the elements of these claims.

Rejections under U.S.C. 103(a) over the DeLorme patent in view of the Meyer patent

Claims 7-9


Independent claim 7 recites:

7. *An apparatus to read digital watermarks embedded within a map, the map being divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective map area, said apparatus comprising:*

a global positioning system receiver to determine a location of said apparatus;
an input device to capture an image of at least a portion of the respective map area;
memory including executable software instructions stored therein, the instructions to extract the location information from the at least one embedded digital watermark from the captured image of at least a portion of the respective map area, and to correlate the location of the apparatus with the extracted location information;
electronic processing circuitry to execute the software instructions; and
an output device to indicate the correlation of the apparatus location and the captured watermark location information.

Claim 7 recites an apparatus to read digital watermarks embedded within a map. For example, and with reference to Fig. 1 (reproduced below), a map includes a plurality of areas (e.g., areas A-M). Each area (e.g., area A) includes a digital watermark embedded therein. The digital watermark for area A includes location information for area A. Area B also includes a digital watermark embedded therein with location information for area B, and so on.

Recall from the discussion above that a digital watermark, as defined in the specification, is a form of steganography. Steganography is an art of encoding physical and electronic objects with plural-bit data such the data is essentially *hidden* from human perception, yet can be recovered by computer analysis of the encoded object. See, e.g., lines 1-3 of paragraph [0013].

| | | | |
|---|---|---|---|
|  | B | C | D |
| H | G | F | E |
| I | J | K | L |
| P | O | N | M |

The apparatus of claim 7 includes an input device (e.g., an optical sensor) to capture an image of at least a portion of the respective map area (e.g., area A). A captured image includes a representation of the digital watermark in area A. Software instructions stored in memory of the apparatus extract, from the captured image, the location information (e.g., corresponding to area A in the map) from the embedded digital watermark.

The location information – *retrieved from the map itself* – is compared to GPS provided location data. A correlation of the watermark information and GPS location data is then output.

The DeLorme patent does not teach or suggest extracting location information from a captured image of a map.

Instead, the DeLorme patent suggests receiving GPS data for a current location, and relying on a user to “intuitively” locate that position on a map. (See, e.g., Fig. 1 and Col. 19, line

41 – Col. 20, line 7, especially Col. 20, lines 5-7.) For example, in the DeLorme patent at Fig. 1, a user reads map grid location (i.e., “C3”) from a GPS device and then uses his finger to locate the corresponding grid location (i.e., grid C3) on the map.

But this is not decoding (or extracting) location information from a captured image. Nor is this using hidden information in a map to trigger a correlation.

The final Office Action also cites the DeLorme patent at Figs. 3-7 and Col. 25, lines 51 – Col. 26, line 43 as teaching these features¹. Please see the final Office Action, page 3, lines 4-10 of paragraph 4.

We respectfully disagree.

Instead, we see a hard copy input system 246 including sheet media input 248 and scanner/reader 249 (see the DeLorme patent at Fig. 7). See also the DeLorme patent at Col. 26, lines 4-6. The hard copy input system 246 seems to be one of many different inputs to a CAMLS system. Such inputs are passed to a mapping display subsystem 213 for possible **display or output**. See Col. 26, lines 31-33 and 37-40.

While information scanned in from a sheet media 248 may be displayed, there is no teaching or suggestion in the DeLorme patent regarding machine-extracting location information for a respective map area from the sheet media input 248.

(Further reference to a scanner in the DeLorme patent is in the context of capturing handwriting for display. For example, a person may hand-write information on a map, and then, with a handheld scanning device, subsequently digitizing that information for **display** on a computer 110 or printer 112. Please see the DeLorme patent FIG. 14F and Col. 63, line 56 – Col. 64, line 6.)

The final Office Action concedes that the DeLorme patent does not teach or suggest digital watermarking. See the final Office Action, page 6, lines 13-14 of paragraph 7.

¹ The features include: “extract the location information from the at least one embedded digital watermark from the captured image of at least a portion of the respective map area, and to correlate the location of the apparatus with the extracted location information.”

To review: 1) the DeLorme patent does not teach or suggest capturing image data of a map to machine-extract location information there from; 2) The DeLorme patent does not teach or suggest embedding map areas with location information; and 3) The DeLorme patent does not teach or suggest digital watermarking. (Other deficiencies need not be belabored at this time.)

The Meyer patent does not remedy these deficiencies.

The Meyer patent is cited by the Examiner as teaching a digital watermark. See the final Office Action, page 7, lines 1-7.

But the Meyer patent is silent on watermarking *location information in a map* and extracting such location information from a captured image.

Like the DeLorme patent, the Meyer patent is also silent with respect to machine-reading (or extracting) location information from a map.

Thus, even if combined as suggested in the final Office Action (which we do not agree should occur), the proposed combination would not teach or suggest each of the features recited in claim 7.

Moreover, the DeLorme patent and the Meyer patent should not be combined as suggested in the final Office Action. There is no teaching or suggestion in the DeLorme patent of using a machine-readable code – let alone a digital watermark – to obtain location information related to a specific area depicted by a map. Thus, one would not be tempted to turn to the Meyer patent to learn about digital watermarking. And, even if one did turn to the Meyer patent, there is no discussion therein of carrying location information as discussed above.

We respectfully request that the final rejection of claim 7 be reversed.

Claim 11

Independent claim 11 recites:

11. *A method of navigating with a map embedded with digital watermarks comprising: machine-reading steganographic indicia from optical scan data representing the map, the steganographic indicia including location information which uniquely identifies the map in which the steganographic indicia is embedded in; comparing the location information to a physical location; and providing feedback to correlate the location information and the physical location.*

Claim 11 recites *machine-reading* steganographic indicia from optical scan data representing a map. The steganographic indicia includes location information which uniquely identifies a map in which the steganographic indicia is embedded.

Cited passages² from the DeLorme patent in the final Office Action do not teach or suggest such features.

Instead of machine-reading location information from a map to uniquely identify the map, the DeLorme patent invites a user to navigate their finger over a map to identify a corresponding location. See, e.g., Fig. 1 and Col. 19, line 41 – Col. 20, line 7.

And the scanners discussed in the DeLorme patent are apparently for displaying information, and not for machine-reading location information embedded in a map. See, e.g., the DeLorme patent at FIG. 14F and Col. 63, line 56 – Col. 64, line 6, and Col. 26, lines 4-6, 31-33 and 37-40.

Like the DeLorme patent, the Meyer patent is also silent with respect to machine-reading location information from a map.

² Figs. 1-6; Col. 4, lines 1-38; Col. 6, lines 21-42; Col. 11, lines 6-19; Col. 14, lines 26 – Col. 15, line 23; Col. 23, lines 1-16; and Col. 60, line 61 – Col. 61, line 38. See the final Office Action, page 8, lines 2-7.

Thus, even if combined as suggested in the final Office Action (which we do not agree should occur), the proposed combination would not teach or suggest each of the features recited in claim 11.

Moreover, the DeLorme patent and the Meyer patent should not be combined as suggested in the final Office Action. There is no teaching or suggestion in the DeLorme patent of using a machine-readable code – let alone a digital watermark – to obtain location information related to a specific area depicted by a map. Thus, one would not be tempted to turn to the Meyer patent to learn about digital watermarking. And, even if one did turn to the Meyer patent, there is no discussion therein of carrying location information as discussed above.

We respectfully request that the final rejection of claim 11 be reversed.

Claims 12-13

Independent claim 12 recites:

12. *A method of correlating a physical location to a map location, the map being divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective area, the method comprising:*

extracting the location information from the watermark at the map location;

comparing the extracted location information to global positioning system (GPS) received coordinates of the physical location; and

providing feedback based on the comparison of the physical location and the map location.

Claim 12 recites a map divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective area. Please see the specification's Fig. 1, reproduced above on page 8, for one example of this arrangement.

While the DeLorme patent might divide a map into areas (see the DeLorme patent at Fig. 1, map 14), there is no teaching or suggestion that the respective map areas include location information embedded therein.

Recall that a digital watermark – a form of steganography – is generally imperceptible and is detectable with computer or machine analysis. See, e.g., paragraph [0013] the specification.

There is no computer or machine-aided extraction of location information from a respective map area, let alone extraction of location information from a digital watermark, in the DeLorme patent.

As discussed above with respect to claim 7, DeLorme's scanners provide scanned data for display. But there is no suggestion of using scanners for reading embedded location codes in maps.

The Meyer patent does not envision carrying map location data or geo-coordinates as digital watermark payload information.

And there is no teaching or suggestion in the Meyer patent regarding machine-reading location information from maps.

Thus, even if combined as suggested (which we do not agree should be done), the proposed combination would not teach or suggest each of the claimed features.

We respectfully request that the final rejection of claim 12 be reversed.

Claim 24

Independent claim 24

24. *An apparatus to read digital watermarks embedded within a map, the map being divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective map area, said apparatus comprising:*

a global positioning system that determines a location of said apparatus;

an input to receive optical scan data corresponding to at least a portion of the respective map area;

memory including executable software instructions stored therein, the instructions to extract location information from the optical scan data of at least a portion of the respective map

area, and to correlate the location of the apparatus with the extracted location information; electronic processing circuitry to process the software instructions; and an output to indicate a correlation of the apparatus location and the watermark location information.

Like many of the previously discussed claims, claim 24 considers a map including digital watermarks embedded therein. And, like claim 12 discussed immediately above, the map is divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective map area.

Claim 24 recites an apparatus capable of reading the digital watermarks from optical scan data associated with the map to obtain the location information for a respective map area.

While the DeLorme patent might divide a map into areas (see the DeLorme patent at Fig. 1, map 14), there is no teaching or suggestion that the respective map areas includes location information embedded therein.

There is no computer or machine-aided extraction of location information from optical scan data representing a respective map area in the DeLorme patent.

And the cited scanners in the DeLorme patent seem merely to contemplate scanning for display of handwriting or media sheets (e.g., maps). But there is no suggestion of using scanners for reading embedded location codes (e.g., digital watermarks) from a map. See, e.g., the DeLorme patent at FIG. 14F and Col. 63, line 56 – Col. 64, line 6, and Col. 26, lines 4-6, 31-33 and 37-40.

The Meyer patent does not teach or suggest extracting location information from maps or other imagery.

And the Meyer patent does not teach or suggest embedding location information with digital watermarks.

Thus, even if combined as suggested (which we oppose), the proposed combination would not teach or suggest each of the features recited in claim 24.

We respectfully request reversal of the final rejection of claim 24.

Claim 10

Independent claim 10 recites:

10. *A method of making a representation of a geographical area comprising: dividing a representation of a geographical area into a plurality of areas; and steganographically encoding plural-bit location data within each of the plurality of areas, wherein the location data is unique per each of the plurality of areas.*

We again refer the Board to Fig. 1, reproduced above on page 8 of this Brief.

A representation of a geographic area (e.g., a map or image) is divided into a plurality of areas (e.g., areas A-M).

Each of the areas (e.g., A-M) is steganographically encoded with plural-bit location data, with the location data being unique per each of the plurality of areas.

For example, area A will include first location data uniquely corresponding to area A, and area B will include second location data that uniquely corresponds to area B.

(Recall that steganographic encoding requires at least a degree of imperceptibility, with the encoded data being machine-readable from computer analysis of the encoded data. See, e.g., the specification at paragraph [0013].)

While the DeLorme patent might divide a map into areas (see the DeLorme patent at Fig. 1, map 14), there is no teaching or suggestion that the respective map areas includes location information embedded therein.

And there is no computer or machine-aided extraction of location information from a respective map area in the cited passages of the DeLorme patent.

And while DeLorme's scanners provide opportunities for display, there is no suggestion of using these scanners for reading embedded location codes.

The Meyer patent does not envision carrying map location data or geo-coordinates as digital watermark payloads.

And there is no teaching or suggestion in the Meyer patent about computer-reading location information from maps.

Thus, even if combined as suggested (which we oppose), the proposed combination would not teach or suggest each of the claimed features.

We respectfully request that the final rejection of claim 10 be reversed.

CONCLUSION AND REQUEST FOR REVERSAL

The applied references collectively fail to teach all of the elements of claims 7-13 and 24. (Other deficiencies of the art need not be further belabored at this time.) As such, the claims are patentable over the applied references.

Appellants respectfully request that the Board reverse the final rejection of claims 7-13 and 24.

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Respectfully submitted,

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CLAIMS APPENDIX

1-6. canceled.

7. (original): An apparatus to read digital watermarks embedded within a map, the map being divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective map area, said apparatus comprising:

- a global positioning system receiver to determine a location of said apparatus;
- an input device to capture an image of at least a portion of the respective map area;
- memory including executable software instructions stored therein, the instructions to extract the location information from the at least one embedded digital watermark from the captured image of at least a portion of the respective map area, and to correlate the location of the apparatus with the extracted location information;
- electronic processing circuitry to execute the software instructions; and
- an output device to indicate the correlation of the apparatus location and the captured watermark location information.

8. (original): The apparatus according to claim 7, wherein said apparatus is a handheld apparatus.

9. (original): The apparatus according to claim 7, wherein the output device provides one of an LED indication, arrow indication, audio indication, grid indication, and visual display.

10. (previously presented): A method of making a representation of a geographical area comprising:

dividing a representation of a geographical area into a plurality of areas; and
steganographically encoding plural-bit location data within each of the plurality of areas, wherein the location data is unique per each of the plurality of areas.

11. (previously presented): A method of navigating with a map embedded with digital watermarks comprising:

machine-reading steganographic indicia from optical scan data representing the map, the steganographic indicia including location information which uniquely identifies the map in which the steganographic indicia is embedded in;

comparing the location information to a physical location; and

providing feedback to correlate the location information and the physical location.

12. (previously presented): A method of correlating a physical location to a map location, the map being divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective area, the method comprising:

extracting the location information from the watermark at the map location;

comparing the extracted location information to global positioning system (GPS) received coordinates of the physical location; and

providing feedback based on the comparison of the physical location and the map location.

13. (previously presented): The method according to claim 12, wherein the location information comprises an index, and said method further comprises indexing a database with the index to identify location information.

14 - 23. canceled.

24. (previously presented): An apparatus to read digital watermarks embedded within a map, the map being divided into a plurality of areas, with each area comprising at least one embedded digital watermark including location information for the respective map area, said apparatus comprising:

a global positioning system that determines a location of said apparatus;

an input to receive optical scan data corresponding to at least a portion of the respective map area;

memory including executable software instructions stored therein, the instructions to extract location information from the optical scan data of at least a portion of the respective map area, and to correlate the location of the apparatus with the extracted location information;

electronic processing circuitry to process the software instructions; and

an output to indicate a correlation of the apparatus location and the watermark location information.

25 - 30. canceled.

31. (previously presented): A method comprising:

inputting a map location to a computing device, wherein the map includes a plurality of digital watermarks embedded therein, and wherein said inputting a map location to a computer device comprises reading at least one of the plurality of digital watermarks, the watermark comprising the map location;

determining a current location;

in the computing device, determining a relationship between the input map location and the current location; and

providing directions from the current location to the map location.

32. (previously presented): The method of claim 31, wherein said determining a current location comprises receiving GPS signals to determine the current location.

EVIDENCE APPENDIX
(No Evidence)

RELATED PROCEEDINGS APPENDIX
(No Related Proceedings)